

**PROFILE OF  
MOUND SITE**

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Office of Oversight  
Environment, Safety and Health  
U.S. Department of Energy

## FOREWORD

Site profiles provide senior Office of Environment, Safety and Health managers with relevant and current site environment, safety, and health performance information as well as communicating to Department of Energy line management the Office of Oversight's concerns and understanding of site conditions. Site profiles are a key management tool used by the Office of Oversight to focus and prioritize independent oversight evaluation activities and to optimize the allocation of Oversight resources. The Office of Oversight maintains site profiles on 20 major Department of Energy sites, and normally updates each profile semiannually through a process of soliciting Department of Energy line management review and comment on the revised site profile information. Upon resolution of any line management comments, the profile is considered validated and is disseminated.

Site profiles are developed using an institutionalized process of collecting data from multiple sources, and then collating, synthesizing, and analyzing this information to develop a balanced evaluation of environment, safety, and health performance at the site. The data that forms the basis of a site profile comes from sources both internal and external to the Department of Energy. Office of Oversight appraisal activities provide an important source of data. Data is also collected and synthesized from such sources as the Defense Nuclear Facilities Safety Board, the General Accounting Office, state regulators, and Department of Energy line management organizations. This information is reported in a format designed to highlight essential missions, performance, significant issues, and operational data at a management level. The process involves additional field verification of initial conclusions to confirm the validity and significance of the information. All Oversight offices participate in the collection, analysis, interpretation, and validation of site profile information.

As the site profile process matures, the Office of Oversight plans to incorporate additional information into the documents, including a presentation of quantitative measures and trends in environmental, safety, and health performance, and a description of safeguards and security activities, performance, and issues.

# PROFILE OF MOUND SITE

## OVERVIEW

### SITE CHARACTERISTICS

*Site characteristics include information on site size and location, mission, organizations, contractual status, and major initiatives and activities.*

**Date Established:** 1948

**Present Mission:** The principal mission of Mound is site cleanup and pursuit of commercial enterprise. Nuclear energy programs continue at Mound with the development of radioisotopic thermoelectric generators (RTGs) for the National Aeronautics and Space Administration's deep-space missions.

*Primary:* Implement Mound 2000, an initiative to expedite the cleanup of the Mound Site.

*Secondary:* Radioisotopic thermoelectric generator (RTG) assembly, disassembly, and testing.

**Size:** The 306 acre Mound Site contains approximately 130 buildings.

**Employees:** 1,074 contractor employees and 200 DOE personnel.

**Annual Budget:** The budget for fiscal year 1996 is approximately \$139.3 million. Approximately \$7.3 million of this budget is controlled by the Miamisburg Area Office for technical projects with organizations other than EG&G Mound Applied Technologies, the management and operating contractor. The estimated budget for fiscal year 1997 is \$106.1 million.

**Cognizant Secretarial Officer:** The Assistant Secretary for Environmental Management became the cognizant secretarial officer in June 1995. The Office of Defense Programs had site responsibility prior to June 1995. The Office of Nuclear Energy also has programmatic interests at Mound.

**Responsible Operations/Area Office:** Ohio Field Office (OH)/Miamisburg Area Office (MB).

**Contractor:** EG&G Mound Applied Technologies, Inc. is the management and operating contractor.

*Additional information on site characteristics is provided in Section 1.0, starting on page 1.*

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**Principal Subcontractors:** Science Applications International Corporation, Weston, Terran Corporation, IT Corporation, Parsons Engineering, ICF Kaiser, American Technologies Incorporated, EG&G Technical Management Company, and A-Plus.

**Fissile Material:** Mound has 25.6 kilograms of plutonium in 28 separate packages, and residual quantities of U-233 in the Semi Works Tritium Complex.

**Significant Commitments to Stakeholders:** The Mound Site was placed on the Superfund National Priority List in 1989. DOE signed a Federal Facility Agreement (FFA) with the U.S. Environmental Protection Agency in 1990. The FFA was amended in 1993 to include the Ohio Environmental Protection Agency. This agreement describes the processes and schedules for the cleanup of contaminated areas at the Mound Site. The terms and provisions of the FFA are currently being revised to facilitate Mound 2000, an initiative to expedite the cleanup of the Mound Site. Mound 2000 represents a fundamental change in site remediation. Rather than evaluating large "Operable Units," which take years of study environmental restoration activities at Mound will individually evaluate the over 400 potential release sites.

*Mound 2000 represents a fundamental change in site remediation. Mound will individually evaluate the over 400 potential release sites.*

The Mound Action Committee has been established to facilitate information exchange and to ensure that community values are factored into the cleanup plans.

DOE and the City of Miamisburg have entered into lease agreements for some site buildings. The city, in turn, is subletting the property to independent businesses to encourage them to be part of a technology mall. Seventeen businesses and 45 business employees were on site as of November 1995.

A Consent Order was signed between DOE and the State of Ohio in October 1995. This Consent Order is related to the treatment and disposal of mixed waste identified in the Mound Plant Site Treatment Plan required by the Federal Facility Compliance Act.

**Unions:** Oil, Chemical, and Atomic Workers (180 members) and the United Plant Guard Workers (46 members).

### **Major Site Activities:**

DOE and the City of Miamisburg have entered into lease agreements for some site buildings.

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The Mound 2000 initiative includes preparing data packages on more than 400 potential release sites; establishing decisionmaking teams of DOE, U.S. Environmental Protection Agency (EPA), and Ohio EPA members to decide on the preferred action.

### **ENVIRONMENT, SAFETY, AND HEALTH (ES&H) ISSUES**

*A sitewide issue is an issue present at multiple facilities or within ES&H programs that impact sitewide operations. A facility-specific issue is limited to a particular facility or building.*

*Additional information on sitewide issues is provided in Section 3.0, starting on page 4*

**Sitewide Issue 1:** Efforts to reduce the economic impact associated with the closure of the Mound Site will require management attention to ensure safety, health, and environmental protection concerns continue to be managed effectively.

*There are 2 sitewide issues at Mound.*

**Sitewide Issue 2:** Improvement is needed in the development and implementation of the facility safety authorization basis program.

### **KEY FACILITIES**

*A key facility is a facility or building that is significant from an environment, safety, and health perspective. At some sites, a key facility can be a group of facilities with similar missions, activities, hazards, or vulnerabilities.*

*Additional information on key facilities is provided in Section 4.0, starting on page 6.*

**Semi-Works/Research (SWR) Tritium Complex** - Tritium component development, component evaluation operations, recovery, and materials analysis.

*There are 6 key facilities at Mound.*

**Technical (T) Building** - Supports tritium programs in areas of reconfiguration, safe shutdown, and remaining operations.

**Building 22, Waste Staging Building** - Storage and staging for solid low-level radioactive waste (LLW) containers generated prior to shipment offsite.

**Building 38** - Assembly and disassembly operations associated with manufacturing Pu-238 RTGs.

**Building 50** - Evaluation of RTG integrity and assemblies and testing for environmental and thermal integrity.

**Building 72** - Storage of miscellaneous hazardous wastes generated at Mound until the wastes can be shipped off site for disposal.

### **SITE PERFORMANCE**

## **MOUND PROFILE OVERVIEW**

Site performance is based on an analysis of available data on facilities and programs. This includes information from Office of Oversight activities augmented by valid and relevant external and internal sources. Site performance is evaluated in terms of three of the guiding principles for safety management.

### **Overall Safety Management Program - NOT EVALUATED**

#### **Principle #1 - Line Management Responsibility - NOT EVALUATED**

MB's ability to provide effective oversight of the contractor safety program has historically been constrained by the number of subject matter experts, safety professionals, and Facility Representatives assigned to Mound. MB has increased the number of Facility Representatives and is expanding their role in site contractor operations oversight. MB has identified that improvement is needed in communicating and clarifying safety roles responsibilities among Facility Representatives and line organizations.

The transfer of site facilities to the city and small businesses created the need to clarify some ES&H concerns raised by site safety professionals. Management resolutions in areas such as maintenance responsibilities to ensure integrity of utility systems responsibility for compliance with the Clean Water Act the and Clear Air Act, potential impacts of 10 CFR 820/830 Price-Anderson regulations, and building access for emergency response have been necessary.

#### **Principle #2 - Comprehensive Requirements - NOT EVALUATED**

Improvement is needed in the development and implementation of the facility safety authorization basis program.

#### **Principle #3 - Competence of Personnel - NOT EVALUATED**

Not evaluated.

**PERFORMANCE MEASURES** - *Performance measures are quantitative and qualitative indications of ES&H performance taken from such sources as the Occurrence Reporting and Processing System and the Computerized Accident/Incident Reporting System, as well as contractually mandated indicators of performance.*

To be provided in future versions of the site profile.

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*Additional information on site performance is provided in Section 2.0, starting on page 2.*

*Additional information on performance measures will be provided in Section 5.0 of future versions of the site profile.*



**Figure 1. Mound Site Map**

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## SITE PROFILE -- MOUND SITE

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### 1.0 SITE CHARACTERISTICS

#### 1.1 SITE LOCATION AND SIZE

The Mound site is located on 306 acres in southwestern Ohio, within the southern boundary of the Miamisburg city limits.

#### 1.2 SITE MISSION

The principal mission of Mound is site cleanup and pursuit of commercial enterprise. Nuclear energy programs continue at Mound with the development of radioisotopic thermoelectric generators (RTGs) for the National Aeronautical and Space Administration's deep-space missions. The process of generating electricity through thermoelectric conversion using a radioisotope heat source was developed and patented at Mound in 1954. Recent uses of the RTGs were in the Galileo and Ulysses spacecrafts, now on missions to Jupiter and the sun, respectively. Four other RTGs are being prepared for the 1997 Cassini mission to Saturn.

Mound is DOE's commercial supplier for stable isotopes, although this mission will not be at Mound after fiscal year 1996. Stable isotope program activities have included the development of isotope separations methods for biomedical applications; molecular research; isotope separations research and development; stable isotope inventory program and worldwide sales; and isotope separation by chemical exchange. Mound's current mission also includes recovery and purification of tritium from tritium-containing scrap materials for future use.

Mound was involved in a number of weapon and nonweapon programs until the late 1980s including research, development, and production of explosive detonators, timers, transducers, switches, firesets, nuclear components, and surveillance performed on

various explosive and nuclear components of weapons taken from the stockpile.

### 1.3 SITE ORGANIZATIONS AND CONTRACT STATUS

#### Site Organizations

Contractor activities at Mound are managed by the Ohio Field Office (OH) and the Miamisburg Area Office (MB). There were approximately 1,074 contractor and 38 MB personnel at Mound in 1996.

#### Contract Status

The contract to manage Mound was awarded to EG&G Mound Applied Technologies, Inc (EG&G MAT) in 1988. The contract runs through September 1996.

### 1.4 MAJOR SITE INITIATIVES/ACTIVITIES

#### Environmental Restoration

In 1995, a decision was made to re-baseline plans for the environmental restoration program. This decision stems from the Mound 2000 initiative that provides for expedited cleanup. This initiative includes preparing data packages on each of the more than 400 potential release sites; establishing decision making teams composed of DOE, U.S. Environmental Protection Agency (EPA) and Ohio EPA members to decide whether to take no further action, perform a removal action, or conduct further assessment based on available information; reviewing the team's decision with the public and revising the decision as appropriate; and implementing the decision.

After all the sites and buildings slated for release in an established geographic area on the site are considered ready to be released, the geographic area (referred to as a release block) is then available for reuse or disposition to commercial interests.

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There were originally nine operable units (OUs) at Mound of which six were active until initiation of Mound 2000. The six that were active are: OU-1 (Area B, groundwater); OU-2 (mainhill); OU-4 (Miami-Erie Canal); OU-5 (South Property); OU-6 (Decontamination and Decommissioning Program); OU-9 (Sitewide). Characterization of two of the former operable units had progressed significantly. A record of decision (ROD) for Operable Unit 1 was signed in June 1995. The selected approach was the collection, treatment, and disposal of contaminated groundwater in the vicinity of the Mound landfill that was used from 1948 to 1974. Volatile organic compounds have contaminated portions of the Buried Valley aquifer, a sole source aquifer for the Miamisburg area. The specific method of treatment is air stripping as discussed in the Administrative Record. The Record of Decision allows for enhancements such as high vacuum extraction or air sparging pending the results of the demonstration project.

Pu-238 contamination in the Miami-Erie canal will be removed from OU-4 beginning in 1996. This contamination resulted from a pipeline rupture at the Mound site in 1969. The removal will involve the excavation and offsite disposal of an estimated 750,000 cubic feet of contaminated soils and sediments.

### **Programmatic Activities**

DOE and the City of Miamisburg have entered into lease agreements for some site buildings (see Sitewide Issue 1).

## **2.0 SITE PERFORMANCE**

### **2.1 CONCEPTUAL BASIS FOR EVALUATION**

The essential characteristic of successful programs and projects is recognizing and understanding of the need for an effective management system that ensures adequate

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control over all aspects of the program or project. In 1994, the Secretary of Energy forwarded to Congress and the Defense Nuclear Facilities Safety Board (DNFSB) the principles and criteria that the Department deemed necessary for an effective safety management program. These principles include:

- Principle #1: Line managers are responsible and accountable for safety.
- Principle #2: Comprehensive requirements exist, are executed, and are appropriate.
- Principle #3: Competence is commensurate with responsibilities.

### **2.2 SAFETY MANAGEMENT PROGRAM IMPLEMENTATION OF THE GUIDING PRINCIPLES**

This interim evaluation was developed using the results of surveillance performed by the Office of EH Residents and other Office of Oversight data sources. The absence of an independent oversight evaluation at Mound suggests that the information presented should not necessarily be considered representative of overall environment, safety, and health (ES&H) performance across Mound, but rather an indication of ES&H performance of the program and/or facility identified. Where sufficient information was not available to make a comprehensive assessment of either the implementation of a guiding principle (Section 2.2) or an implementing program (Section 2.3), a limited evaluation or specific example of performance, based on the best available information, is provided.

#### **Principle #1 - Line Management Responsibility for Safety**

MB's ability to provide effective oversight of the contractor safety program has historically been constrained by the number of subject matter experts, safety professionals, and Facility Representatives assigned to Mound. MB has recently increased the number of

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Facility Representatives and is expanding their role in site contractors operations oversight MB has identified that improvement is needed in communicating and clarifying roles responsibilities for safety among Facility Representatives and line organizations.

The transfer of site facilities to the city and small businesses created the need to clarify some ES&H concerns raised by site safety professionals. Management resolutions in areas such as maintenance responsibilities to ensure integrity of utility systems responsibility for compliance with the Clean Water Act the and Clear Air Act, potential impacts of 10 CFR 820/830 Price-Anderson regulations, and building access for emergency response have been necessary.

In 1992, an Office of Environment, Safety and Health Progress Assessment identified staffing issues underlying many of the more specific deficiencies, and a DNFSB staff member commented in a 1995 trip report that there was only one MB Facility Representative assigned to several nuclear facilities. Other ES&H personnel include three nonnuclear safety professionals (including the team leader and one of the remaining persons who will retire soon) and two health physics personnel.

Historically there have been only one or two Facility Representatives assigned to cover the entire Mound Plant. Their activities were focused to covering basic requirements (e.g., occurrence reporting, conduct of operations) associated with key nuclear facilities primarily. As a consequence, there has been little interaction between Facility Representative organization and waste management facilities, environmental restoration activities, and decontamination and decommissioning activities. Recent additions to the Facility Representative staff have resulted in MB's expanding the assignment of Facility Representatives to address these areas in addition to the key nuclear facilities.

Interviews conducted by the Office of Oversight during February 1996 with MB safety professionals and several line program

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managers indicated that MB has recognized that communications and coordination between these groups and the Facility Representative organization needs to be improved.

### **Principle #2 - Comprehensive Requirements**

Improvement is needed in the development and implementation of the facility safety authorization basis program (see Sitewide Issue 2).

### **Principle #3 - Competence Commensurate with Responsibilities**

*Not evaluated.*

## **2.3 IMPLEMENTING PROGRAMS**

### **Environmental Protection Program**

The site commercialization program has identified the need for management to closely monitor and clarify legal aspects related to responsibility for compliance with the Clean Air Act and Clean Water Act.

### **Nuclear Safety Program**

The site commercialization program has identified the need for management to closely monitor and clarify legal aspects related to potential impacts of 10 CFR 820/830 Price Anderson regulations. Also see Sitewide Issue 2 on authorization basis.

### **Worker Safety and Health Program**

*Not evaluated.*

### **Facility Safety Program**

*Not evaluated.*

## **3.0 SITEWIDE ES&H ISSUES**

**3.1 ISSUE DESCRIPTIONS**

**Sitewide Issue 1: Site Closure Concerns**

Efforts to reduce the economic impact associated with the closure of the Mound Site will require management attention to ensure safety, health, and environmental protection concerns continue to be managed effectively.

DOE and the City of Miamisburg have entered into lease agreements for some site buildings. The city, in turn, is subletting the property to independent businesses to encourage them to become part of a technology mall. Seventeen businesses and 145 business employees are involved and are on site as of November 1995. Legal agreements define delegation of responsibility between DOE, the contractor, Miamisburg Mound Community Improvement Corporation (MMCIC), and the commercial businesses.

DOE MB indicates that, in the lease agreement, the lessee is responsible for establishing their own ES&H program. DOE and the contractor **have no responsibility for ES&H protection measures of commercial business operating in leased spaces**

**MB has determined that no current commercial business operation presents a concern to the DOE relative to compliance with environmental permits.**

MB line and safety professionals have documented several concerns during this transition. Where these concerns have been warranted, DOE MB reports that these issues are discussed with the City of Miamisburg. Some examples of these concerns and resolutions are listed below for information:

- 10 CFR Part 820/830 and Price Anderson regulations require the indemnified management and operating (M&O) contractor (EG&G MAT) to comply with nuclear safety requirements. These requirements include: "nuclear facility," "public," and "site boundaries" must be clearly defined; roles and

responsibilities of co-located non-employees (city/tenants) must also be clearly defined; and co-located employees must be subject to certain site requirements, such as training emergency planning and response, and access controls. MB reports that potential impacts of 10 CFR 820/830 and Price-Anderson regulations are under review by the contractor; OH Counsel advises MB that the commercial businesses should be treated as the "public" for purposes of contractor liability; and that the contractor is evaluating changes needed for safety analysis documents.

- Inclusion of occurrence reporting requirements in the lease agreements with the city was examined. It was determined that the contractor has no responsibilities to report occurrences of commercial businesses operating within the leased space. Should any commercial business accident impact either the DOE or contractor workforce or assets, the event will be reported as any other externally caused event would be reported.
- Clean Air and Clean Water Act compliance details have been examined. MB reports that it works closely with the commercial business to determine what the business will be discharging and the potential impacts to DOE's air and water discharge permits. Each commercial business must obtain their own environmental permits at their own expense; the commercial businesses are required to provide copies of their Material Safety Data Sheets (MSDS) to the DOE, and DOE is assessing the costs and risks of installing monitors at the building source, as well as negotiating with the City of Miamisburg on the ultimate ownership of the utility systems.
- Determinations associated with lessee reporting requirements for nonnuclear related provisions under the Emergency Planning and Community Right to Know (EPCRA) SARA Title III Act required some

clarification. MB reports that the M&O contractor is responsible for reporting its operations only, and that each commercial business is responsible for reporting its operations. MB reports that each business has been provided appropriate reporting forms, sample MSDSs, and address information. DOE and the Mound Plant Fire Department are provided copies of MSDSs.

- Building access for emergency response costs for hazardous material spill response equipment, and fire inspection requirements required some clarification. The Mound Fire Department has master keys to each commercial business for emergency response purposes, and lease exhibits require that all appropriate costs associated with hazardous materials response be reimbursed by the sublessee. The M&O contractor provides operation and maintenance of the fire alarm systems in all buildings. An existing Memorandum of Understanding with the City of Miamisburg, as well as the lease itself, specifies fire response expectations.

**Sitewide Issue 2: Safety Authorization Basis**

MB, OH, and previous independent ES&H assessments, along with an analysis of occurrence reports, indicate that improvement is needed in the development and implementation of the facility safety authorization basis program. MB reports reflect inadequate implementation of revised safety analysis reports (SARs), resulting in safety requirement violations. In the 1994 Plutonium Vulnerability Study, the working group identified several buildings for which formal authorization basis was incomplete and stated that this problem stemmed from a lack of approved SARs and other safety documents. A review of occurrence reports for the period January 1995 through February 1996 provides several examples supporting these previous observations:

- A March 1995 review of limiting conditions of operation (LCOs) contained in the final

safety analysis report (FSAR) for the Semi-Works/Research (SW/R) Tritium Complex identified a violation of ventilation system surveillance requirements. The surveillance was being conducted monthly rather than weekly as required. The LCO review found that the high efficiency particulate air (HEPA) filter differential pressure surveillance was in violation of the SWR Tritium Complex LCO requirements. As a result of these LCO noncompliance findings, surveillance requirements for the Technical (T) Building were reviewed, and six instances of noncompliance were identified from May through November 1995.

- Also in March 1995, during sitewide LCO compliance review, it was noted that the Mound Fire Department tested fire suppression systems quarterly, although it is required monthly. The failure to perform the wet alarm test at the proper interval put Building 38 technically out of compliance with the LCO requirement by MD-103. This was reported as Issue 3 in the Operational Safety Requirement (OSR) for Building 38, Section 4.6.2.
- In May 1995, the LP-50 loading operation in R Building, Room 108, was determined to be outside the bounding safety analysis. The safety analysis bounding accident states the probability of  $1 \times 10^{-4}$  per year for a release of 10 grams from a primary containment (man-safe) vessel. The LP-50 loading operations, as conducted, have a similar consequence, but with a probability of approximately  $1 \times 10^{-2}$  to  $1 \times 10^{-3}$  per year for an LP-50 primary container. The increase in probability results from the fact that the LP-50 primary container design is not the same as the man-safe unit described in the bounding accident analysis.
- In August 1995, the quantities of transuranic (TRU) material in certain containers in Building 31A were found to exceed the limit authorized in the Hazard Classification Determination Document. A

review of the inventory list of Mound TRU waste inventories revealed that Building 23 contained TRU waste quantities that exceeded authorized amounts.

- In November 1995, TRU mixed waste was transferred from Building 23 to Building 31A for analysis. The safety authorization basis approved by MB on October 30, 1995 required a completed risk analysis prior to relocation of waste.
- In August 1995, OH issued a memorandum indicating that Mound was out of compliance with five separate line items directly attributable to the absence of a formal hazard assessment. OH stated that the lack of a formal hazard assessment document is contributing to a reduction in safe conduct of operation.

### **3.2 SITEWIDE ISSUE STATUS**

Table 1 characterizes sitewide issues in terms of an issue statement, primary concerns, site activities, and progress evaluation.

### **4.0 KEY FACILITIES**

At Mound, there are six key facilities. Of the six, five are nuclear or radiological facilities: the Semi-Works/Research (SW/R) Tritium Complex, the Technical (T) Building, and Buildings 38, 50, and 72. The sixth building is a nonnuclear hazardous chemical storage facility, Building 72.

#### **4.1 FACILITY MISSION**

##### **Semi-Works (SW/R) Tritium Complex**

This two-story facility is used primarily for handling tritium. Four major operations are currently performed in the SW/R Tritium Complex: component development, component evaluation operations, tritium

**Table 1. Sitewide Issues**

<b>ISSUE</b>	<b>PRIMARY CONCERNS</b>	<b>SITE ACTIVITIES</b>	<b>PROGRESS EVALUATION</b>
<p>1. Efforts to reduce the economic impact associated with the closure of the Mound Site will require management attention to ensure safety, health, and environmental protection concerns continue to be managed effectively.</p>	<p>MB line and safety professionals documented several concerns and examples resulting in a continued need for management involvement in resolving issues related to transitioning facilities to local businesses.</p>	<p>None identified.</p>	<p>Not evaluated <b>(updated 5/96)</b></p>
<p>2. Improvement is needed in the development and implementation of facility safety authorization basis program.</p>	<p>In August 1995, OH issued a memorandum to the MB Associate Director, Safety, Operations and Technical Support indicating that, during a recent review of the Manual of Function, Assignments and Responsibilities, Mound was found to be out of compliance with five separate line items directly attributable to the absence of a formal hazard assessment. OH stated that the lack of a formal hazard assessment document is contributing to a reduction in safe conduct of operation.</p>	<p>None identified.</p>	<p>Not evaluated <b>(updated 5/96)</b></p>

recovery, and materials analysis. The SW/R was constructed in 1950 and has undergone 13 major additions. One corridor of rooms in the adjacent building, Research (R), has been converted to tritium operations and, together with the SW building and Building 58, form the SW/R complex. While the complex is primarily a tritium facility, three additional areas exist. This facility will eventually be demolished as part of decontamination and decommissioning activities.

### **Technical (T) Building**

The T Building was originally used to purify Po-210 for use in nuclear weapons initiators. The current mission is to support tritium programs for reconfiguration, safe shutdown, and remaining operations. The facility has also been used to extract radionuclides, to house the plutonium verification facility, and to store TRU materials. Since 1980, the KYIE (classified), Tritium Emission Recovery Facility (TERF), Hydrogen Isotope Separation System (HISS), and other tritium facilities large enough to handle multi-kilogram quantities were added to T Building. T Building is expected to remain in either operational or standby mode for several years.

Special nuclear material (SNM), primarily Pu-239, is stored in T-Building storage areas A and B prior to transfer to Building-38 for repackaging. The SNM is in the form of metal, metal oxide, residue, and/or combinations thereof; these materials are contained in sealed drums and other metal containers and are approximately 20 years old. The consequence severity was primarily estimated by comparison to the bounding consequence, defined as a pressurized ground level release of 736g of Pu-239 oxide powder from birdcage 182, which is the maximum inventory scheduled for movement on the site that must be repackaged and shipped off site to a receiver site. This nuclear material will have to be moved from one onsite location to another in accordance with facility nuclear material limits for material

unpacking, stabilizing, and/or repackaging for shipment.

Some containers include small amounts of other SNM, such as U-233, Pu-238, mixed oxides of plutonium, and normal or slightly enriched uranium. The exact configuration and condition of the multiple containers in the drums and other containers cannot be determined until they are opened and the contents inspected.

### **Building 38**

Building 38 was originally designed to be a radiochemical processing facility for Pu-238 used in the oxide form as a fuel for RTGs. Building design began in 1965, and construction was completed in December 1967. The assembly and disassembly operations associated with manufacturing Pu-238 heat source modules for RTGs is the primary operation conducted in Building 38. Other programs conducted in Building 38 include the assembly of three types of heat sources and two types of RTGs and general-purpose radionuclide handling. RTG and heat source assembly and disassembly are supported in the F-line operations and involve the Five-watt, High Power Generator Mod 3 and General Purpose Heat Sources (GPHS) programs. This work is funded by the Office of Nuclear Energy. The radiochemical analysis operations, wet chemistry analysis, and "orphan source" (radioactive sources for which DOE does not have ownership) programs are carried out in the A-line. This work supports overall Mound operations.

Under the criteria in previous DOE Order 6430.1A, Building 38 would not meet the definition of a special facility but would be subject to the general requirements for special facilities as well as the general requirements for a "hot lab." Building 38 does not meet the definition of a plutonium processing and handling facility (PPHF). Building 38 has not been a PPHF for several years, and it is not planned to again use Building 38 to process large quantities of plutonium.

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In its present condition, Building 38 does not meet the required loading criteria required by DOE-STD-1020-94 for a Performance Category (PC)2 facility. Under a design basis seismic event, structural failure is expected to occur, with partial collapse being possible or probable. This possibility has been analyzed with the conclusion that none of the encapsulated plutonium would be dispersed. Fuel clad containment has been tested under more severe conditions without breach.

### **Building 50**

Building 50 is an RTG assembly and test laboratory. Encapsulated Pu-238 fuel received from the primary encapsulating agency is loaded into graphite assemblies in Building 38 and welded into stainless steel containers. They are then transferred to Building 50 for fuel reduction and subsequent installation into electrical converters (which then form the RTG).

### **Building 22, Waste Staging Facility (WSF)**

The WSF facility provides storage and staging for solid low-level radioactive waste (LLW) containers generated prior to offsite shipment. The facility can store up to 186 metal boxes stage lined and unlined 30 gallon or 55 gallon metal drums with or without overpack, and stage closed wooden boxes that contain LLW. The drums are stacked on pallets. The transition to the WSF was completed in June 1995. Building 22, constructed in 1967, previously housed a property management warehouse, office spaces, and a test facility for glovebox operations.

Approximately 99 percent of the waste stored in the facility is low specific activity or DOE non-regulated material. The waste includes combustibles, such as wipes and shoe covers, and noncombustibles such as tools, equipment, and sludges solidified in cement. The wastes do not contain liquids, Resource Conservation and Recovery Act hazardous materials, compressed gases, etiologic agents, chelating agents, or respirable fines. If tritium is stored, the contractor states that radiological controls provide airborne monitoring. If Pu-239 is stored, the quantity is

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to be maintained below 450 grams to meet criticality requirements (DOE-STD-1027-92).

### **Building 72**

Building 72 is used to store miscellaneous hazardous wastes generated at Mound until the wastes can be shipped offsite for disposal. The wastes are contained in steel drums, plastic drums, plastic and steel containers of various sizes, and gas cylinders. Waste sampling, packaging, and repackaging of some wastes; drum overpacking; and container inspection and marking are also conducted in this facility. The quantities of hazardous chemicals in the facility can be up to 13,000 gallons. Building 72 is a steel framed building with metal panel siding on three walls.

## **4.2 FACILITY SUMMARY**

Table 2 summarizes key facility characteristics, including status, hazard classification, authorization basis, worst case design basis accident, and principal hazards and vulnerabilities.

## **5.0 PERFORMANCE MEASURES**

This section is under development and will be presented in future versions of the site profile.



Table 2. Facility Summary

FACILITY NAME	STATUS	HAZARD CLASSIFICATION/AUTHORIZATION BASIS	WORST CASE DESIGN BASIS ACCIDENT	PRINCIPAL HAZARDS AND VULNERABILITIES
Semi-Works/ Research Tritium Complex	Operational	Hazard Category 2. Final safety analysis report written to DOE Order 5481.1B (1994); upgrade in progress to meet DOE Order 5480.23 requirements.	Uncontrolled fires and earthquakes that are beyond design basis.	<b>Hazards:</b> Tritium, Pu-238
Technical Building	Operational	Hazard Category 2. Final safety analysis report written to DOE Order 5480.1A (1984). Submitted June 1995 for upgrade to DOE Order 5480.23 requirements; returned to contractor October 1995. Also USQ U-1995-023	Unmitigated release of plutonium during handling	<b>Hazards:</b> Tritium, Pu-238, Pu-239, U-233
Building 38	Operational	Hazard Category 3. Final safety analysis report written to DOE Order 5481.1A (1989). Submitted January 1995 for upgrade to DOE Order 5480.23 requirements. OH approval is pending a revision to the OH Safety Evaluation Report	None. Evaluation basis accident is unmitigated release of encapsulated plutonium initiated by natural phenomena.	<b>Hazards:</b> Encapsulated plutonium oxide
Building 50	Operational	Below Hazard Category 3 radiological facility. Final Safety Analysis Report to Building 50 RTG Assembly and Test Facility, approved November 1995	No consequences from to public from natural phenomena initiated accidents.	<b>Hazards:</b> External radiation dose to personnel working in proximity to RTG
Building 22, Waste Staging Facility (WSF)	Operational	Building temporarily being used as a Below Hazard Category 3 facility. Approved Auditable Safety Analysis (ASA) in place. Plans to consolidate materials in Building 22 will increase quantities above Category 3 thresholds. MB and contractor are planning to develop a BIO or revised ASA.	Standard industrial: minor releases of radioactive material.	<b>Hazards:</b> Low-level radioactive waste
Building 72	Operational	Non-nuclear hazardous chemical storage facility.	Spill of hazardous liquid wastes caused by container failure by natural phenomena or facility upset condition (e.g., fire).	<b>Hazards:</b> Bulk waste streams (various hazardous chemicals)